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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/371,692	08/10/99	KALSI S	05770/082001

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EXAMINER	
PEREZ, G	
ART UNIT	PAPER NUMBER
2834	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No.	Applicant(s)	
	09/371,692	KALSI, SWARN S.	
	Examiner	Art Unit	
	Guillermo Perez	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 March 2001* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☒ The proposed drawing correction filed on *17 April 2000* is: a)☒ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)
16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
18) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1 to 4, 9, 12 to 14, 16 and 21 to 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabinowitz et al. (U. S. Pat. No. 5, 325, 002) in view of Higashi (U. S. Pat. No. 4,885,494).

Rabinowitz et al. ('002) disclose a superconducting electric motor (figure 6) comprising:

a rotor assembly (61, 62, 63, 64) including:

at least one superconducting winding (62, 63 and column 5, lines 66-68 and column 6, lines 1-3) which, in operation, generates a flux path within the rotor assembly (61, 62, 63, 64). Rabinowitz et al. ('002) disclose a support member (61) which supports the at least one superconducting winding (62,63), the rotor assembly (61, 62, 63, 64) configured to operate in a synchronous mode of operation at temperatures wherein the superconducting winding (62,63) exhibits superconducting characteristics and in an induction mode of operation at temperatures wherein the superconducting winding (62, 63) exhibits non-superconducting characteristics (column 6, lines 60 to 64; column 9, lines 4 to 15 and 33 to 38).

Rabinowitz et al. ('002) disclose that the rotor assembly (61, 62, 63, 64) includes induction structure configured to allow the superconducting motor to generate a starting torque which is at least 50% of the rated torque in the induction mode of operation (column 9, lines 4 to 32). Rabinowitz et al. ('002) disclose that the rotor assembly (61, 62, 63, 64) includes induction structure configured to allow the superconducting motor to generate a peak torque which is approximately twice the rated torque in the induction mode of operation (column 9, lines 4 to 32).

Rabinowitz et al. ('002) disclose that the induction structure includes the support member (61) which supports the at least one superconducting winding (62,63). Rabinowitz et al. ('002) disclose a stator assembly (60) electromagnetically coupled to the rotor assembly (61, 62, 63, 64).

Rabinowitz et al. ('002) disclose an adjustable speed drive providing an electrical signal to the stator assembly (60) (column 9, lines 4 to 32). Rabinowitz et al. ('002) disclose that the adjustable speed drive provides a signal at a first frequency to the stator (60) to start the superconducting motor in the synchronous mode of operation and provides a signal at a second frequency, less than the first frequency, to the stator (60) in the induction mode of operation (column 9, lines 4 to 32).

Rabinowitz et al. ('002) disclose that the superconducting winding (62,63) includes a high temperature superconductor (see Table 2) and that the support member (61) is formed of aluminum.

Rabinowitz et al. ('002) disclose a method of operating a superconducting electric motor of the type including a rotor assembly (61, 62, 63, 64) including at least one

superconducting winding (62,63) which, in operation, generates a flux within the rotor assembly (61, 62, 63, 64), and a support member (61) which supports the at least one superconducting winding (62,63). Rabinowitz et al. ('002) disclose that the method comprises:

- monitoring the temperature of the superconducting winding (62,63)
- operating the superconducting motor in a synchronous mode at a temperature wherein the superconducting winding exhibits superconducting characteristics
- operating the superconducting motor in an induction mode at a temperature wherein the superconducting winding exhibits non-superconducting characteristics (column 9, lines 4 to 32).

Rabinowitz et al. ('002) disclose that operating the superconducting motor in the synchronous mode includes providing an electrical signal to a stator assembly (60), electromagnetically coupled to the rotor assembly (61, 62, 63, 64), the signal having a first frequency. Rabinowitz et al. ('002) disclose that operating the superconducting motor in the induction mode includes providing a signal to the stator assembly (60) at a second frequency, less than the first frequency (column 9, lines 4 to 32).

However, Rabinowitz et al. ('002) do not disclose that the rotor assembly includes induction structure for carrying current at levels sufficient to allow the steady-state induction mode of operation.

Higashi discloses that the rotor assembly (figure 5) includes induction structure for carrying current at levels sufficient to allow the steady-state induction mode of

operation (column 4, lines 38-61). Higashi's invention have the purpose of improving efficiency of the electric motor at start-up and operation.

It would have been obvious at the time the invention was made to modify the superconducting electric motor of Rabinowitz et al. ('002) and provide it with the rotor assembly disclosed by Higashi for the purpose of improving efficiency of the electric motor at start-up and operation.

2. Claims 5 to 8, 10 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabinowitz et al. ('002) in view of Higashi as applied to claims 1, 4 and 9 above, and further in view of Rabinowitz (U. S. Pat. No. 4, 176, 291).

Rabinowitz et al. ('002) and Higashi disclose a superconducting electric motor as described on item 1 above. However, neither Rabinowitz et al. ('002) nor Higashi disclose that at least a portion of the induction structure is spaced from the at least one superconducting winding by a thermal isolation vacuum region. Neither Rabinowitz et al. ('002) nor Higashi disclose that the at least portion of the induction structure spaced from the at least one superconducting winding by a thermal isolation vacuum region includes an electromagnetic shield member. Neither Rabinowitz et al. ('002) nor Higashi disclose a cryostat positioned between the thermal isolation vacuum region and the induction structure. Neither Rabinowitz et al. ('002) nor Higashi disclose that the electromagnetic shield member includes a conductive, non-magnetic material. Neither Rabinowitz et al. ('002) nor Higashi disclose that the induction structure further includes an electromagnetic shield spaced from the at least one superconducting winding by a

thermal isolation vacuum region. Neither Rabinowitz et al. ('002) nor Higashi disclose that the superconducting winding is a racetrack shaped winding.

Rabinowitz ('291) discloses that at least a portion of the induction structure (18) is spaced from the at least one superconducting winding (44) by a thermal isolation vacuum region (19). Rabinowitz ('291) discloses that the at least portion of the induction structure (18) spaced from the at least one superconducting winding (44) by a thermal isolation vacuum region (19) includes an electromagnetic shield member (18). Rabinowitz ('291) discloses a cryostat (58, 59, 60) positioned between the thermal isolation vacuum region (19) and the induction structure (18).

Rabinowitz ('291) discloses that the electromagnetic shield member (18) includes a conductive, non-magnetic material. Rabinowitz ('291) discloses that the superconducting winding (44) is a racetrack shaped winding. Rabinowitz's invention have the purpose of screening the superconducting winding from non-synchronous components of the magnetic fields produced by unbalanced or transient currents in the armature winding and absorb thermal radiation from the ambient temperature and re-radiating it at a lower temperature.

It would have been obvious at the time the invention was made to modify the superconducting electric motor of Rabinowitz et al. ('002) and Higashi and provide it with the induction structure, the thermal isolation vacuum region, the electromagnetic shield member, the cryostat, and the superconducting winding disclosed by Rabinowitz ('291) for the purpose of screening the superconducting winding from non-synchronous components of the magnetic fields produced by unbalanced or transient currents in the

armature winding and absorb thermal radiation from the ambient temperature and re-radiating it at a lower temperature.

3. Claims 17 to 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabinowitz et al. ('002) in view of Higashi and further in view of Renard et al. (U. S. Pat. No. 3, 904, 901).

Rabinowitz et al. ('002) and Higashi disclose a superconducting electric motor as described on item 1 above and also that the superconducting winding, in operation, generates flux within the rotor assembly Rabinowitz et al. ('002) and Higashi disclose an electromagnetic shield surrounding the cryostat and the at least one superconducting winding. However, neither Rabinowitz et al. ('002) nor Higashi disclose a cryostat surrounding the rotor assembly.

Renard et al. disclose a cryostat (119, 120) surrounding the rotor for the purpose of maintaining the at least one superconducting winding at cryogenic temperatures.

It would have been obvious at the time the invention was made to modify the superconducting electric motor of Rabinowitz et al. ('002) and Higashi and provide it with a cryostat surrounding the rotor as disclosed by Renard et al., for the purpose of maintaining the at least one superconducting winding at cryogenic temperatures.

4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rabinowitz et al. ('002) in view of Higashi and of Rabinowitz ('291) as applied to claim 10 above, and further in view of Kalsi et al. (U. S. Pat. No. 5, 602, 430).

Rabinowitz et al. ('002), Higashi and Rabinowitz ('291) disclose a superconducting electric motor as described on item 2 above. However, neither

Rabinowitz et al. ('002), Higashi nor Rabinowitz ('291) disclose that the support member includes a plurality of laminations, each lamination lying in a plane parallel to magnetic field flux lines extending through the laminations during operation of the superconducting electric motor.

Kalsi et al. disclose that the support member (3) includes a plurality of laminations, each lamination lying in a plane parallel to magnetic field flux lines (55) extending through the laminations during operation of the superconducting electric motor (figures 1 and 2) for the purpose of reducing the migration of stray magnetic flux out of the core poles.

It would have been obvious at the time the invention was made to modify the superconducting electric motor of Rabinowitz et al. ('002), Higashi and Rabinowitz ('291) and provide it with a support member including a plurality of laminations as disclose by Kalsi et al. for the purpose of reducing the migration of stray magnetic flux out of the core.

5. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rabinowitz et al. ('002) in view of Higashi and further of Renard et al. as applied to claim 17 above, and further in view of Kalsi et al. (U. S. Pat. No. 5, 602, 430).

Rabinowitz et al. ('002), Higashi and Renard et al. disclose a superconducting electric motor as described on item 3 above. However, neither Rabinowitz et al. ('002), Higashi nor Renard et al. disclose that the support member includes a plurality of laminations, each lamination lying in a plane parallel to magnetic field flux lines

extending through the laminations during operation of the superconducting electric motor.

Kalsi et al. disclose that the support member (3) includes a plurality of laminations, each lamination lying in a plane parallel to magnetic field flux lines (55) extending through the laminations during operation of the superconducting electric motor for the purpose of reducing the migration of stray magnetic flux out of the core poles.

It would have been obvious at the time the invention was made to modify the superconducting electric motor of Rabinowitz et al. ('002), Higashi and Renard et al. and provide it with a support member including a plurality of laminations as disclose by Kalsi et al., for the purpose of reducing the migration of stray magnetic flux out of the core.

Response to Arguments

Applicant's arguments filed March 22, 2001 have been fully considered but they are not persuasive.

In response to Applicant's argument that "*Rabinowitz teaches away from the inclusion of a superconducting winding in a rotor assembly*", it must be noted that Rabinowitz acknowledge the choice of making the conductive material as a conducting wire. Rabinowitz is not choosing the wire-shaped design because that allows the use of "*substantially any type of superconducting material*". There are superconducting materials which "*are too brittle to be easily and/or cost effectively formed as superconducting wires*" (column 5, lines 66-68 and column 6, lines 1-3), which implies

that some superconductive materials can be formed as wires. Based on the disclosure of Rabinowitz, it is well known in the art to shape the superconducting material as wires.

Windings are not made only in a wire form, they are also formed as flat (foil), squared, rectangular, or diametrical cross-section windings as long as the intended purpose of generating a magnetic field is accomplished. Rabinowitz discloses that the material can be shaped like a foil ("*very thin sheet metal*" Merriam-Webster's Collegiate Dictionary tenth edition) winding. Rabinowitz discloses that the *wire-formed* winding was not selected in his invention, but the *foil-formed* winding is a preferred choice. Thus, the claim limitation "*at least one superconducting winding*" is disclosed by Rabinowitz.

Higashi also teaches that the superconducting material in the rotor is a superconducting winding (column 2, lines 51-58).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Guillermo Perez whose telephone number is (703) 306-5443. The examiner can normally be reached on Monday through Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703) 308 1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305 3432 for regular communications and (703) 305 3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956.

Guillermo Perez
May 24, 2001

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